



National Weather Service Climate Prediction Center

[Site Map](#)[News](#)[Organization](#)[Search](#)

CPC Search

About Us

[Our Mission](#)
[Who We Are](#)

Contact Us

[CPC Information](#)
[CPC Web Team](#)[HOME](#) > [Expert Assessments](#) > Atlantic Hurricane Outlook Update

[NOAA PRESS RELEASE](#)

NOAA: August 2004 Update to Atlantic Hurricane Season Outlook

Issued: 10 August 2004

[Realtime monitoring of tropical Atlantic conditions](#)
[Realtime monitoring of tropical East Pacific conditions](#)

[Atlantic Hurricane Outlook & Seasonal Climate
Summary Archive](#)

SUMMARY

NOAA's updated [outlook for the 2004 Atlantic hurricane season](#) indicates a 45% probability of an above-normal season, a 45% probability of a near-normal season, and only a 10% chance of a below-normal season, according to a consensus of scientists at the National Oceanic and Atmospheric Administration's (NOAA) [Climate Prediction Center \(CPC\)](#), the [Hurricane Research Division \(HRD\)](#), and the [National Hurricane Center \(NHC\)](#). See [NOAA's definitions](#) of above-, near-, and below-normal seasons.

The outlook calls for 12-15 tropical storms, with 6-8 becoming hurricanes, and 2-4 of these becoming major hurricanes. This predicted activity reflects a likely continuation of increased hurricane activity that began in 1995, reiterating our [pre-season outlook](#) issued May 17.

This outlook is based on favorable conditions now in place in association with the [ongoing active Atlantic multi-decadal signal](#), which includes [warmer than normal sea-surface temperatures](#) in the tropical Atlantic. However, weak El Niño conditions are possible during the next few months, which makes the probability of an above-normal season slightly less likely from that stated in May, and the probability of a near-normal season slightly more likely. Whether El Niño forms or not, considerable tropical storm and hurricane activity is expected this season.

DISCUSSION

1. Expected Activity- **45% chance above normal, 45% chance near normal, 10% chance below normal**

An important measure of the total seasonal activity is NOAA's [Accumulated Cyclone Energy \(ACE\) index](#), which accounts for the collective intensity and duration of Atlantic tropical storms and hurricanes during a given hurricane season. The ACE index is also used to define above-, near-, and below-normal hurricane seasons (see [Background Information](#)). For the 2004 Atlantic hurricane season the predicted ACE range is 90%-150% of the median. This range is slightly lower than the 100%-160% range stated in the May outlook, and reflects the increased possibility of weak El Niño conditions during the peak of the season. An ACE value of 117% of the median corresponds to the lower boundary for an above-normal season.

The likely range of tropical storms during 2004 is 12-15, with 6-8 of these systems becoming hurricanes, and 2-4 of these becoming major hurricanes [categories 3-4-5 on the Saffir-Simpson scale]. *While it is reasonable to expect this range of tropical storms and hurricanes, the total seasonal activity measured by the ACE index can certainly be in the expected range without all three of these criteria being met.*

Even if a weak El Niño develops, many of the tropical storms and hurricanes are expected to form during August-October [over the tropical Atlantic and Caribbean Sea](#) between 9°N-21.5°N. Systems forming in this region often become hurricanes and major hurricanes, and generally track westward toward the Caribbean Sea and/or United States as they strengthen. Historically, normal-to-above normal hurricane seasons have averaged 2-3 [landfalling hurricanes](#) in the continental United States and 1-2 hurricanes in the region around the Caribbean Sea. However, it is currently not possible to confidently predict at these extended ranges the number or intensity of landfalling hurricanes, or whether a given locality will be impacted by a hurricane this season.

2. Expected Climate Conditions – **Active Atlantic multi-decadal signal, above-normal Atlantic SSTs, and borderline ENSO-neutral/ weak El Niño conditions**

Beginning with 1995 all but two Atlantic hurricane seasons have been above normal. The exceptions are the two El Niño years of 1997 and 2002. This increased activity contrasts sharply with the generally below-normal seasons observed during the previous 25-year period 1970-1994. The atmospheric and oceanic conditions controlling these very long-period fluctuations in hurricane activity are referred to as the Atlantic multi-decadal signal.

The active phase of the Atlantic multi-decadal signal has been a primary contributing factor to the increased hurricane activity since 1995 (Goldenberg et al. 2001). Key aspects of this signal (Chelliah and Bell, 2004) are again in place, and are conducive to an above normal season. [These aspects](#) include 1) [warmer SSTs across the tropical Atlantic](#), 2) an amplified subtropical ridge at upper levels across the central and eastern North Atlantic, 3) reduced vertical wind shear in the deep tropics over the central North Atlantic, which results from an expanded area of easterly winds in the upper atmosphere (green arrows) and weaker easterly trade winds in the lower atmosphere (dark blue arrows), and 4) a configuration of the African easterly jet (wavy light blue arrow) that favors hurricane development from tropical disturbances moving westward from the African coast.

ENSO is another climate phenomenon that can significantly impact seasonal Atlantic hurricane activity (Gray 1984), with El Niño acting to reduce activity and La Niña acting to increase activity. The most recent [ENSO Diagnostic Discussion](#) issued by NOAA's Climate Prediction Center indicates borderline ENSO-neutral to weak El Niño conditions in the tropical Pacific through August-October. If a weak El Niño develops, it could produce enhanced upper-level westerlies and increased vertical wind shear over

the Caribbean Sea and western tropical Atlantic. These conditions would be less conducive to tropical storm and hurricane development in that region. This possibility of weak El Niño conditions, combined with the active multi-decadal signal, is the basis for predicting equal probabilities of an above-or near-normal Atlantic hurricane season.

3. Multi-decadal fluctuations in Atlantic hurricane activity

Atlantic hurricane seasons exhibit prolonged periods lasting decades of generally above-normal or below-normal activity. These multi-decadal fluctuations in hurricane activity result nearly entirely from differences in the number of hurricanes and major hurricanes forming from [tropical storms first named in the tropical Atlantic and Caribbean Sea](#). Tropical cyclone activity during 1995-2003 has been considerably above normal in response to the active phase of the Atlantic multi-decadal signal. During 1995-2003 [hurricane seasons have averaged](#) 13 tropical storms, 7.7 hurricanes, 3.6 major hurricanes, and have an average ACE index of 159% of the median. NOAA classifies all but two of these nine seasons (the El Niño years of 1997 and 2002) as above normal. In contrast, during the preceding 1970-1994 period, hurricane seasons averaged 8.6 tropical storms, 5 hurricanes, and 1.5 major hurricanes, and had an average ACE index of only 70% of the median. NOAA classifies twelve (almost one-half) of these 25 seasons as being below normal, and only three as being above normal (1980, 1988, 1989).

Time series of key [atmospheric wind parameters](#) and [Atlantic SSTs](#) associated with the Atlantic multi-decadal signal highlight the dramatic differences between these above-normal and below-normal periods. The active phase of the Atlantic multi-decadal signal was also present during the above-normal hurricane decades of the 1950s and 1960s, as indicated by [comparing Atlantic SSTs and seasonal ACE values](#).

4. Uncertainties in the Outlook

The primary uncertainties in this outlook are whether a weak El Niño will develop during August-October, and if it does develop, whether it will be of sufficient strength to reduce late-season hurricane activity. The latest statistical and dynamical ENSO predictions indicate borderline ENSO-neutral/ weak El Niño conditions through October.

However, there is considerable uncertainty in these ENSO predictions. If El Niño does not develop, the favorable conditions now in place over the tropical Atlantic will likely result in an above-normal Atlantic hurricane season. This likelihood diminishes depending on how soon an El Niño develops and how strong it becomes.

CAUTIONARY NOTES

1) It is currently not possible to confidently predict at these extended ranges the number or intensity of landfalling hurricanes, or whether a particular locality will be impacted by a hurricane this season. Therefore, residents and government agencies in coastal and near-coastal regions should always maintain hurricane preparedness efforts regardless of the overall seasonal outlook.

2) Far more damage can be done by one major hurricane hitting a heavily populated area than by several hurricanes hitting sparsely populated areas or, of course, not making landfall at all. Therefore, hurricane-spawned disasters can occur even in years with near-normal or below-normal levels of activity. Examples of years with near-normal levels of activity that featured extensive hurricane damage and numerous fatalities include 1960 (Hurricane Donna), 1979 (Hurricanes David and Frederic), and 1985 (Hurricanes Elena, Gloria and Juan). Moreover, the nation's costliest hurricane, Andrew in 1992, occurred during a season with below normal overall activity.

FORECASTERS

[NOAA's Climate Prediction Center](#)

Dr. Gerald Bell, Meteorologist; Gerry.Bell@noaa.gov

Dr. Muthuvel Chelliah, Physical Scientist; Muthuvel.Chelliah@noaa.gov

Dr. Kingste Mo, Meteorologist; Kingste.Mo@noaa.gov

[NOAA's Hurricane Research Division](#)

Stanley Goldenberg, Meteorologist; Stanley.Goldenberg@noaa.gov

Dr. Christopher Landsea, Meteorologist; Chris.Landsea@noaa.gov

[NOAA's National Hurricane Center](#)

Eric Blake, Meteorologist; Eric.S.Blake@noaa.gov

Dr. Richard Pasch, Meteorologist; Richard.J.Pasch@noaa.gov

References

Chelliah, M., and G. D. Bell, 2004: Tropical multi-decadal and interannual climate variability in the NCEP/ NCAR Reanalysis. *J. Climate*, **17**, 1777-1803.

Goldenberg, S. B., C. W. Landsea, A. M. Mestas-Núñez, and W. M. Gray, 2001: The recent increase in Atlantic hurricane activity: Causes and implications. *Science*, **293**, 474-479.

Gray, W. M., 1984: Atlantic seasonal hurricane frequency: Part I: El Niño and 30-mb quasi-biennial oscillation influences. *Mon. Wea. Rev.*, **112**, 1649-1668.













